

**Exemption No. 7922A**

**UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
RENTON, WASHINGTON 98055-4056**

In the matter of the petition of

**Cessna Aircraft Company**

for an exemption from § 25.785(b) of  
Title 14, Code of Federal Regulations

**Regulatory Docket No.  
FAA-2003-12399**

**GRANT OF EXEMPTION**

By letter L390-01-03-3841, dated October 23, 2003, Mr. Larry Van Dyke, Manager - Airworthiness, Cessna Aircraft Company, One Cessna Boulevard, P.O. Box 7704, Wichita, Kansas 67277-7704, petitioned for an amendment to Exemption No. 7922, issued on November 20, 2002. That exemption granted Cessna Aircraft Company certain relief from the general occupant protection requirements of Title 14 Code of Federal Regulations (14 CFR) 25.785(b) for persons occupying multiple-place side-facing seats during takeoff and landing on Cessna Model 750 airplanes manufactured prior to January 1, 2004. The petitioner now requests an amendment to Exemption No. 7922 to remove the limitation that restricts its applicability to airplanes manufactured prior to January 1, 2004.

**The petitioner requests relief from the following regulation:**

Section 25.785(b), Amendment 25-64, requirements for general occupant protection for occupants of multiple-place side-facing seats that are occupied during takeoff and landing.

**The petitioner's supportive information is as follows:**

“Cessna Aircraft Company hereby respectfully submits a petition for an indefinite extension to Exemption No. 7922 for the installation of a Cessna manufactured multiple occupancy side-facing couch in the Cessna Model 750 aircraft. Exemption No. 7922, which granted Cessna relief from the general occupant protection requirements of 14 CFR 25.785(b), is set to expire on January 1, 2004.

“It is Cessna’s position that the requirements for, and the justifications in support of, the exemption remain valid and has not changed from the original application. In addition, the conditions and circumstances regarding public interest that warranted the original grant of exemption continue to exist.

“Cessna has demonstrated, by analysis and tests, that the side-facing couch has successfully complied with the conditions and limitations of the current exemption. This extension, if granted, would allow Cessna to deliver the Model 750 airplanes with a customer desired multiple place side-facing couch seating configuration.

“Based on the rationale provided and taking into consideration the excellent safety record of the Cessna Citation series aircrafts, Cessna Aircraft Company hereby petitions for an indefinite extension of the previously granted Exemption No. 7922 for the installation of a multiple place side-facing couch on Model 750. If FAA finds that an indefinite extension is not permissible, Cessna requests that the current expiration date of January 1, 2004 be extended appropriately for Exemption No. 7922.”

#### **Notice and Public Procedure**

In accordance with 14 CFR 11.87, the Federal Aviation Administration (FAA) finds, for good cause, that action on this petition should not be delayed by publication and comment procedures because granting the petition would not set a precedent.

#### **The FAA’s analysis/summary is as follows:**

Exemption No. 7922 was granted to Cessna Aircraft Company with a limitation that restricted its applicability to airplanes manufactured before January 1, 2004. The petitioner has requested that this limitation be removed.

Side-facing seats are considered a novel design for transport category airplanes that include Amendment 25-64 in their certification bases, and were not considered when those airworthiness standards were promulgated. Hence, the existing regulations do not provide adequate or appropriate safety standards for occupants of multiple-place side-facing seats. The FAA has been conducting research to develop an acceptable method of compliance with § 25.785(b) for multiple-place side-facing seat installations. Without an acceptable method of compliance available, the FAA finds that it is in the public interest to grant an exemption to the petitioner for Cessna Model 750 airplanes. This public interest argument does not justify granting exemptions once an acceptable method of compliance with § 25.785(b) is developed. As a result, the FAA does not intend to grant similar exemptions once an acceptable method of compliance is developed.

In consideration of the foregoing, I find that an amendment to Exemption No. 7922 is in the public interest and will not affect the level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator, Cessna Aircraft Company is hereby granted an amendment to Exemption No. 7922 to remove the limitation that restricts its applicability to airplanes manufactured prior to

January 1, 2004. This amended exemption is applicable to Cessna Model 750 airplanes. All other limitations of Exemption No. 7922 apply to this exemption. These limitations are provided below.

1. Existing Criteria: All injury protection criteria of § 25.562(c)(1) through (c)(6) apply to the occupants of side-facing seating. The Head Injury Criterion (HIC) assessments are only required for head contact with the seat and/or adjacent structures.
2. Body-to-Body Contact: Contact between the head, pelvis, or shoulder area of one Anthropomorphic Test Dummy (ATD) on the adjacent seated ATD's is not allowed during the test conducted in accordance with § 25.562(b)(1) and (b)(2). Incidental contact of the legs, feet, arms and hands that will not result in incapacitation of the occupants is acceptable. Any contact between adjacent ATD's is acceptable during rebound.
3. Body-to-Wall/Furnishing Contact: If the side-facing divan is installed aft of a structure, such as an interior wall or furnishing, that would contact the pelvis, upper arm, chest, or head of an occupant seated next to the structure, then a conservative representation of the structure and its stiffness must be included in the tests. In most cases, the representation of the structure would be more rigid and have less deflection under load than the actual installation on the airplanes. The contact surface of this structure must be covered with at least 2 inches of energy-absorbing protective foam, such as ensolite. However, if the test was conducted without the 2-inch padding and met the TTI, lateral pelvic acceleration, and HIC requirements, and the applicant demonstrated that the contact surface was homogeneous, the 2-inch padding requirement for contact surfaces installed forward of the side-facing seat could be eliminated.
4. Thoracic Trauma: The Thoracic Trauma Index (TTI) injury criteria measurement must be less than 85, as defined in 49 CFR part 572, subpart F. TTI data must be processed as defined in Federal Motor Vehicle Safety Standard (FMVSS), part 571.214, section S6.13.5. Should torso contact of an occupant at the forward most seat place occur during testing, TTI must be substantiated by dynamic test or rationale based upon previous testing of a similar design/installation. If it can be shown from known occupant movement data that the torso of an occupant at the forward most seat place will not be contacted in conditions up to the maximum test load, a TTI measurement is not required based on this absence of torso contact. This requirement is applicable to the forward most seat place of each individual seat module. Torso contact during rebound is acceptable and need not be measured.
5. Pelvis: Lateral pelvic acceleration for all side-facing seat occupants must be substantiated if there is pelvic contact during testing. Should occupant pelvic contact occur, lateral pelvic acceleration must be substantiated by dynamic test or rationale based on previous dynamic testing of a similar design/installation. When conducting an actual test to obtain a lateral pelvic acceleration value, an appropriate test device capable of recording such a value should be used. Pelvic acceleration data must be processed as

defined in Federal Motor Vehicle Safety Standard (FMVSS) Part 571.214, Section S6.13.5. Pelvic lateral acceleration must not exceed 130g.

6. Shoulder Strap Loads: Where upper torso straps (shoulder straps) are used for sofa occupants, tension loads in individual straps must not exceed 1,750 pounds. If dual straps are used for restraining the upper torso, the total strap tension loads must not exceed 2,000 pounds.
7. Seat Positions: All seat positions need to be occupied by ATD's for the longitudinal tests.
8. End Closures: All side-facing seats require end closures or other means to prevent the occupant from translating off of the seat.
9. Longitudinal Tests: For the longitudinal tests conducted in accordance with the conditions specified in § 25.562(b)(2), a minimum number of tests will be required as follows:
  - a. One test will be required with ATD's in all positions, with undeformed floor, 10 degrees yaw, and with all lateral supports (armrests/walls). For configurations with a wall or bulkhead immediately forward of the forward seat position on the sofa, a SID ATD will be used in the forward seat position and a Hybrid II ATD(s) or equivalent will be used for all other seat locations. For configurations without a wall or bulkhead immediately forward of the forward seat, Hybrid II ATD's or equivalent will be used in all seat locations.
  - b. One test will be required with Hybrid II ATD's or equivalent in all positions, with deformed floor, 10 degrees yaw, and with all lateral supports (armrests/walls). This could be considered the structural test as well.
10. Vertical Test: For the vertical test, conducted in accordance with the conditions specified in § 25.562(b)(1), Hybrid II ATD's or equivalent will be used in all seat positions.

Issued in Renton Washington, on December 24, 2003.

/s/ Ali Bahrami  
Acting Manager  
Transport Airplane Directorate  
Aircraft Certification Service